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# **BENCH & REFERENCE MARK CATALOGUE PORTSMOUTH, NEWPORT AND WARWICK, RHODE ISLAND**

August 1994



**US Army Corps  
of Engineers**  
New England Division

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13. ABSTRACT (Maximum 200 words)  This study, which developed a catalogue of bench and reference marks for several communities in Rhode Island, was conducted by the Long Range Planning Branch, Planning Directorate, New England Division, U.S. Army Corps of Engineers at the request of the Rhode Island Department of Administration, Division of Planning. The catalogue encompasses the towns of Portsmouth, Newport, and Warwick. It includes a description of existing bench and reference as well as several bench marks established by the Corps of Engineers as part of this effort. The catalogue will enable communities to better monitor and enforce the base flood elevation (100-year frequency) requirements contained in the National Flood Insurance Program				
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BENCH AND REFERENCE MARK CATALOGUE  
FOR THE COMMUNITIES OF  
PORTSMOUTH, NEWPORT, AND WARWICK

PREPARED FOR:

STATE OF RHODE ISLAND  
DEPARTMENT OF ADMINISTRATION  
DIVISION OF PLANNING  
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AUGUST 1994

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BENCH AND REFERENCE MARK CATALOGUE  
FOR THE COMMUNITIES OF  
PORTSMOUTH, NEWPORT, AND WARWICK, RHODE ISLAND

STUDY PURPOSE AND SCOPE

This study developed a catalogue of bench and reference marks for several communities in Rhode Island. The catalogue will enable communities to better monitor and enforce the base flood elevation (100-year frequency) requirements contained in the National Flood Insurance Program (NFIP). Where additional marks were found to be necessary, new bench marks were established as part of this effort.

This work was conducted by the U.S. Army Corps of Engineers, New England Division, for the State of Rhode Island's Department of Administration, Division of Planning, under the Corps' Flood Plain Management Services (FPMS) Program. The FPMS program is authorized under Section 206 of the Flood Control Act of 1960 (PL 86-645).

The scope of work included:

- Identifying those communities, through coordination with the NFIP State Coordinator, that needed a bench mark inventory.
- Conducting a records search of all existing bench and reference mark information.
- Field checking this information to determine if the marks still existed.
- Establishing new marks in areas lacking coverage.

METHODOLOGY

Initial coordination with the State's National Flood Insurance Program (NFIP) coordinator revealed that there were five communities in Rhode Island where a catalogue of bench and reference marks would be useful. Those communities in order of priority were: Westerly, Charlestown, Portsmouth, Newport, and Warwick. A catalogue for Westerly and Charlestown was developed previously and is contained in a report published by the Corps dated November 1993.

The first step in the cataloguing effort was to research all existing bench and reference mark information in or near the floodplains of each community. The first source considered, the

Flood Insurance Studies (FIS), listed many reference marks. Other sources included: the Rhode Island Department of Transportation (DOT), the Rhode Island Office of Statewide Planning, and each community's department of public works and/or engineering office. Once the information was gathered, all relevant marks were displayed on a map that also depicted the floodplain. This information was then field checked to verify whether or not the marks still existed. Those marks that were found to no longer exist were removed from further consideration.

A meeting was then held with the NFIP State Coordinator to discuss the inventory, locate where gaps existed, and identify where to install additional marks. The NFIP State Coordinator chose to establish new marks in areas where there was a definite need, in areas where traditionally there were flooding problems or areas of recent development. This resulted in establishing eight new bench marks: two in Portsmouth, three in Newport, and three in Warwick. The newly established marks were surveyed by the Corps of Engineers, New England Division. The marks were established in permanent structures, such as walls, bridge abutments, and granite curbing. Marks established on granite curbing consisted of chiseled squares at least 0.25-inch deep. One area in Portsmouth did not contain any permanent structures on which to place the mark and therefore the mark is a railroad spike set in a utility pole. Several reference marks are located around each Corps established bench mark which can also be retrieved for future use.

#### STUDY RESULTS

The following catalogue lists the bench and reference marks for the towns of Portsmouth, Newport, and Warwick. Those elevation bench marks installed by the Corps of Engineers are included and designated as such. They were established using existing bench and reference mark elevations identified in the records search phases of this study. Due to the limited funding of the study, existing reference mark elevations could not be verified. Therefore, there may be some carry over of error in establishment of some of the new marks. The NFIP State Coordinator is aware of this and is satisfied that the accuracy of the elevations is sufficient for the purpose intended.

All relevant marks are shown on Figures 1, 2, and 3. Those marks established by the Corps of Engineers are shown in red. Additional information on marks established by the Corps of Engineers is shown in the attached Appendix.

## CONCLUSION

This study attempted to provide a catalogue of all existing bench and reference marks within or adjacent to the floodplains of certain Rhode Island communities. Research of several different sources followed by verification of existing marks were done to ensure the quality of the catalogue information. Where gaps were found to exist in areas of historic flood damage or new development, new marks were installed. Eight such elevation marks were installed by Corps of Engineers personnel. The following tables and figures show the results of the cataloguing effort.

TABLE 1  
BENCH AND REFERENCE MARKS  
PORTSMOUTH

<u>DESIGNATION</u>	<u>ELEVATION (FEET NGVD)</u>	<u>DESCRIPTION</u>
BM 1	11.23	A Corps of Engineers mark established 5/94. It is a chiseled "X" in the rim of a water valve cover near the intersections of Mansfield Avenue, Lakeville Avenue, and Anthony Road. The mark is on Mansfield Avenue across from utility pole #17.
RM-1	16.40	A chiseled square on the southeast corner of the gas pump island on the northwest side of the maintenance garage at the golf course. The golf course entrance is about 0.8 miles west along Anthony Road from the Sakonnet River Bridge (Rte 24).
V27	26.02	A standard USC&GS disk, stamped "V 27 1969", set on the top of the west end of the north concrete bannister of the highway overpass over Anthony Road. The overpass is about 0.2 miles west of the Sakonnet River Bridge.
U27	39.32	A standard USC&GS disk, stamped "U 27 1969", set on the top of the south end of the west concrete abutment of the Sakonnet River Bridge. The disk is about 1 foot above the level of the highway.
RM-2	20.77	A railroad spike set in a utility pole at the northwest corner of the property of 28 Cliff Avenue.

TABLE 1  
BENCH AND REFERENCE MARKS  
PORTSMOUTH

<u>DESIGNATION</u>	<u>ELEVATION (FEET NGVD)</u>	<u>DESCRIPTION</u>
RM-3	32.43	A chiseled square cut in the southwest corner of the southeast parapet wall of Cove Bridge.
498	8.88	An RIBPR disk, stamped "498", set on the top and 2.0 feet northeast of the southwest end of the southeast concrete base for the southeast concrete bannister of the abandoned Stone Bridge over the Sakonnet River. Disk is 166 feet east of the center line of Point Road.
BM 2	11.78	A Corps of Engineers mark established 5/94. It is a railroad spike set 0.6 feet up a utility pole at the intersection of Pine Street and Cottage Avenue. The unmarked pole is adjacent to #46 Cottage Avenue.
RM-7	21.85	A chiseled square cut in the northeast corner of the catch basin at the northwest corner of the intersection of Tallman Avenue and Aquidneck Avenue.
RM-8	64.26	A chiseled square cut in the northeast corner of the catch basin at the southeast corner of the intersection of Water Street and Power Street.
RM-9	39.82	A chiseled square cut in the southwest corner of a 9 foot x 16 foot concrete vault (#A-3). The vault is across from Weaver Cove and on the east side of Burma Road.

TABLE 1  
BENCH AND REFERENCE MARKS  
PORTSMOUTH

<u>DESIGNATION</u>	<u>ELEVATION</u> <u>(FEET NGVD)</u>	<u>DESCRIPTION</u>
TIDAL 1	8.23	A standard USC&GS disk, stamped "NO 1 RESET 1965", set in the top and at the end of the concrete bulkhead at Alden Yachts. The mark can be reached by going to the old Melville Naval Base area and then to the end of Alden Landing Road. The mark is about 1 foot above the level of the parking area.
RM-5	17.10	A railroad spike set in utility pole #52 on the west side of Narragansett Avenue and approximately 600 feet north of Sophie Manor Lane.
RM-4	15.04	A chiseled square cut in the south end of a partially buried boulder approximately 65 feet north of the intersection of Narragansett Avenue and Alta Pier Street and approximately 35 feet east of Narragansett Avenue.
B 28	72.92	A standard USC&GS disk, stamped "B 28 1969", set vertically in the east face and at the southeast corner of the east one of the two first concrete piers north of the south concrete abutment of the Mount Hope Toll Bridge.

TABLE 1  
BENCH AND REFERENCE MARKS  
PORTSMOUTH

<u>DESIGNATION</u>	<u>ELEVATION (FEET NGVD)</u>	<u>DESCRIPTION</u>
H 27	9.30	A standard USC&GS disk, stamped "H 27 1969", set on the top and 3.2 feet west of the east end of a two foot high retaining wall at the old ferry landing on Mount Hope Bay. The disk can be reached by going 0.3 miles north along Bristol Ferry Road from the south end of the Mount Hope Toll Bridge to the ferry landing.

TABLE 2  
BENCH AND REFERENCE MARKS  
NEWPORT

<u>DESIGNATION</u>	<u>ELEVATION (FEET NGVD)</u>	<u>DESCRIPTION</u>
RM-2	11.33	A railroad spike in utility pole #11 located on the northeast corner of the intersection of Ellery Road and Aborn Street.
BM-19	6.56	A chiseled square on the southwest corner of a catch basin on the north side of Memorial Boulevard; just south of the pump house and about 1000 feet east of the junction with Old Beach Road.
BM-51	24.24	A chiseled square on the northeast corner of the concrete base of a light pole on the east side of Ocean Avenue at the junction of Coggeshall Avenue.
BM-50	8.10	A chiseled square at the center of the granite front of a catch basin on the south side of Ocean Avenue; just west of the entrance to Bailey Beach Swim Club.
BM-57	23.19	A railroad spike in utility pole #NEC-8 set 0.95 feet above the ground at the northwest corner of Ruggles Avenue and Weatherly Avenue and across the road from the west side of McCormick Road.
BM-41	10.45	A chiseled square on the top of a concrete sea wall. Mark is located at a bend in the wall on the southeast side of Ocean Avenue and about 800 feet northeast of Harrison Avenue.



TABLE 2  
BENCH AND REFERENCE MARKS  
NEWPORT

<u>DESIGNATION</u>	<u>ELEVATION (FEET NGVD)</u>	<u>DESCRIPTION</u>
BM-36	30.35	A chiseled square on the center of the top step of an old stone stairway on the east side of Ocean Avenue. The mark is about 250 feet south of the junction with Winans Avenue.
Z 28	52.08	A standard USC&GS disk, stamped "Z 28 1969", set on the top of a rock outcrop 26 feet south of the center line of Harrison Avenue and 3.5 feet above the level of the road. The mark can be reached by going 0.55 miles west along Harrison Avenue from the junction of Halidon Avenue.
Y 28	6.86	A standard USC&GS disk, stamped "Y 28 1969", set on top and at the northwest corner of a 13 foot by 8 foot concrete top of a water manhole. The mark is about 0.1 miles east of the junction with Halidon Avenue and 28 feet north of north curb of Wellington Avenue.
BM 3	6.20	A Corps of Engineers mark established 5/94. It is a chiseled square in a granite curb near the intersection of Marchant Street and Narragansett Avenue. The mark is near utility pole #5 at the corner of the intersection and across from house #39.

TABLE 2  
BENCH AND REFERENCE MARKS  
NEWPORT

<u>DESIGNATION</u>	<u>ELEVATION (FEET NGVD)</u>	<u>DESCRIPTION</u>
X 28	6.87	A standard USC&GS disk, stamped "X 28 1969", set on top and 11.5 feet west of the east end of the concrete sea wall. The mark is in the southeast corner of Newport Harbor and about 243 feet north of the center line of Wellington Avenue.
W 28	17.56	A standard USC&GS disk, stamped "W 28 1969", set vertically in the north sandstone wall near the northwest corner of the main post office building. The mark is 82 feet south of the center of Franklin Street and 30.5 feet east of the east curb on Thames Street.
1 (USE)	15.76	The mark is the top of the stone foundation at the southwest corner of the 3 story brick building at the corner of Thames and Green Streets. The mark is 10 feet east of the east curb of Thames Street, 4.5 feet north of the north curb of Green Street, and 1.3 feet above the level of the sidewalk.
BM 4	6.54	A Corps of Engineers mark established 5/94. It is a chiseled square in a granite curb at the intersection of Farwell street and the rotary leading to Goat Island. The mark is adjacent to utility pole #6 on the southwest edge of the gravel lot for the Newport Old Coloney Railroad.

TABLE 2  
BENCH AND REFERENCE MARKS  
NEWPORT

<u>DESIGNATION</u>	<u>ELEVATION (FEET NGVD)</u>	<u>DESCRIPTION</u>
BM 5	10.49	A Corps of Engineers mark established 5/94. It is a chiseled square set in the top of a concrete sea wall behind the Newport Islander Doubletree Hotel on Goat Island. The four foot high sea wall is adjacent to a paved road that runs behind the hotel.
TIDAL 6	6.16	A standard USC&GS disk, stamped "6 1943", set in the top and 1.3 feet southwest of the northeast end of a concrete slab, 53 feet southwest of the center line of Luce Avenue, and about level with the sidewalk.
TIDAL 1	34.30	A standard USD&GS disk, stamped "NO 1 1931", set vertically in the granite face on the east side of the War College Building near the northeast corner of the south wing. The mark is located 0.2 miles northwest along Luce Avenue from the main gate to Coasters Harbor Island and is at ground level.
P 28	6.74	A standard USC&GS disk, stamped "P 28 1969", set on the top and 3 feet south of the north end of the east lower abutment of the bridge over Coasters Harbor. The mark is located about 20 feet north of the center line of Ninth Street and 2 feet below the level of the road.

TABLE 3  
BENCH AND REFERENCE MARKS  
WARWICK

<u>DESIGNATION</u>	<u>ELEVATION (FEET NGVD)</u>	<u>DESCRIPTION</u>
RM-2	21.11	An RIBPR disk, set flush with the sidewalk on the west side of Elmwood Avenue bridge over the Pawtuxet River, approximately 1 foot northwest of a cement post light pole.
RM-6	52.92	A standard USC&GS disk, stamped "B 2 1923", set on top of the southeast end of the northeast concrete abutment of a railroad overpass over Lincoln Avenue. The mark is about 10 feet above the level of the road.
407	32.26	An RIBPR disk set in the top of a concrete post in the driveway of #567 West Shore Road. The mark is in the Conimicut section of Warwick at the intersection of West Shore Road and Cambridge Avenue.
M 24	24.36	A standard USC&GS disk, stamped "M 24 1969", set vertically in the southeast brick wall at the east corner of the two-storied brick building behind the Warwick Community Health Center. The mark is located on Steele Avenue about 3 feet above the level of the ground.

TABLE 3  
BENCH AND REFERENCE MARKS  
WARWICK

<u>DESIGNATION</u>	<u>ELEVATION (FEET NGVD)</u>	<u>DESCRIPTION</u>
L 24	6.90	A standard USC&GS disk, stamped "L 24 1969", set on the top of the southwest end of the northwest concrete head wall of an 8 foot concrete culvert with wing walls over Lockwood Brook. The mark is located 0.1 miles northeast of Church Avenue and is 1 foot below the level of West Shore Road.
BM 6	10.58	A Corps of Engineers mark established 5/94. It is a chiseled square in a granite curb on Oakland Beach Avenue. The mark is near the intersection of Mohawk Avenue and is in front of Joe's Barber Shop.
BM 7	5.73	A Corps of Engineers mark established 5/94. It is a chiseled "X" in the rim of a water valve cover near the intersection of Spadina Avenue and Point Avenue. The mark is on Spadina Avenue across from utility pole #21.
411	25.53	An RIBPR disk set in the top of a concrete post at the junction of West Shore Road and Oakland Beach Avenue. The mark is located in the northeast corner of the intersection 1 foot above the level of the road and 11 feet south-southeast of a metal flagpole.

TABLE 3  
BENCH AND REFERENCE MARKS  
WARWICK

<u>DESIGNATION</u>	<u>ELEVATION (FEET NGVD)</u>	<u>DESCRIPTION</u>
BERRY RM 1	32.32	A standard USC&GS disk, stamped, "BERRY NO 1 1968", set on top of the northwest concrete curb of the driveway leading northeast to the Warwick Veterans Memorial High School. The mark is 95 feet southwest of and across from a circular drive that has a flagpole.
K 24	42.99	A standard USC&GS disk, stamped "K 24 1969", set in the top of the southeast concrete foundation which projects out 1.4 feet southeast from the southeast wall of the church. The mark is 32 feet northeast of the south corner of the church and 1.2 feet below the top of the wall.
RM-10	23.89	A standard USC&GS disk, stamped "J 2 1923", set on top of the south concrete abutment of a railroad overpass over West Shore Road (Rte 117). The mark is about 3 feet below the level of the tracks.
RM-11	19.92	An RIBPR disk set in the southwest corner of the intersection of Greenwich Avenue and Centerville Road. The mark is near the northeast corner of the service station and level with the sidewalk.

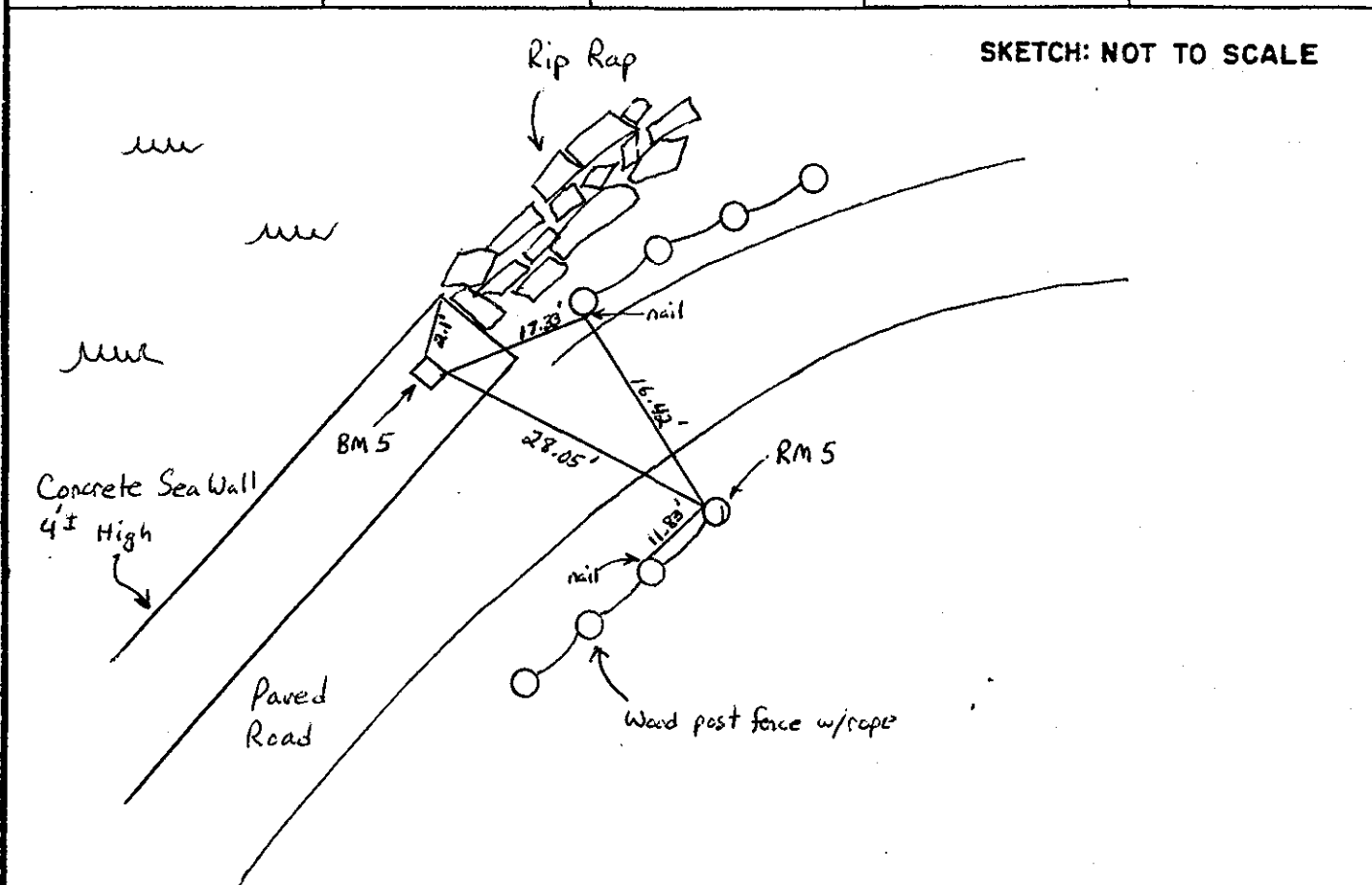
TABLE 3  
BENCH AND REFERENCE MARKS  
WARWICK

<u>DESIGNATION</u>	<u>ELEVATION (FEET NGVD)</u>	<u>DESCRIPTION</u>
C 17	19.25	A standard USC&GS disk, stamped "C 17 1965", set on top of the south end of the west concrete head wall of an abandoned concrete culvert. The mark is 77 feet north of the center line of Ashmont Street and 14.5 feet west of the Post Road (Rte 1) curb.
A 9	33.46	A standard USC&GS disk set on top of the southeast end of the northeast abutment of the railroad overpass over Forges Road. The mark is 6.8 feet southeast of the railroad tracks and 2 feet below the level of the tracks.
BM 8	7.89	A Corps of Engineers mark established 6/94. It is a chiseled square in a granite curb located on the rotary at the end of Ives Road. The rotary is near the intersection of Ives Road and Bradford Avenue in the Potowomut area of Warwick.

PROJECT <i>FPMS</i>		TYPE OF MARK <i>Chiseled square</i>		STATION <i>BM 5</i>	
LOCALITY <i>Newport, RI</i>		STAMPING ON MARK		AGENCY (CAST IN MARKS) <i>USACE</i>	ELEVATION <i>10.49</i> (FT) (M)
LATITUDE		LONGITUDE		DATUM	DATUM <i>N6VD</i>
(NORTHING) (FT)	(EASTING) (FT)	GRID AND ZONE		ESTABLISHED BY (AGENCY) <i>USACE</i>	
(NORTHING) (FT) (M)	(EASTING) (FT) (M)	GRID AND ZONE		DATE <i>5/27/94</i>	ORDER

TO OBTAIN GRID AZIMUTH, ADD TO THE GEODETIC AZIMUTH  
TO OBTAIN GRID AZ. (ADD) (SUB.) TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC) (GRID) (MAGNETIC)	BACK AZIMUTH	GEOD. DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)



**REMARKS:**

*BM 5 is a chiseled square in a concrete sea wall behind the Newport Islander Doubletree Hotel on Goat Island, elev. 10.49'*

*RM 5 is a railroad spike set 0.8' up a wood post fence, elev. 8.64'*



**US Army Corps  
of Engineers  
New England Division**

**DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION**  
For use of this form, see TM 5-237; the proponent  
agency is TRADOC.

**REFERENCES:**  
**FIELD BOOK NO.** \_\_\_\_\_





NARRAGANSETT  
BAY

## LEGEND

- EXISTING MARKS
- MARKS ESTABLISHED BY  
U.S. ARMY CORPS OF ENGINEERS

SCALE  
3000 0 3000 6000 FEET

TOWN  
OF  
MIDDLETOWN

BENCH AND REFERENCE MARK  
CATALOGUE

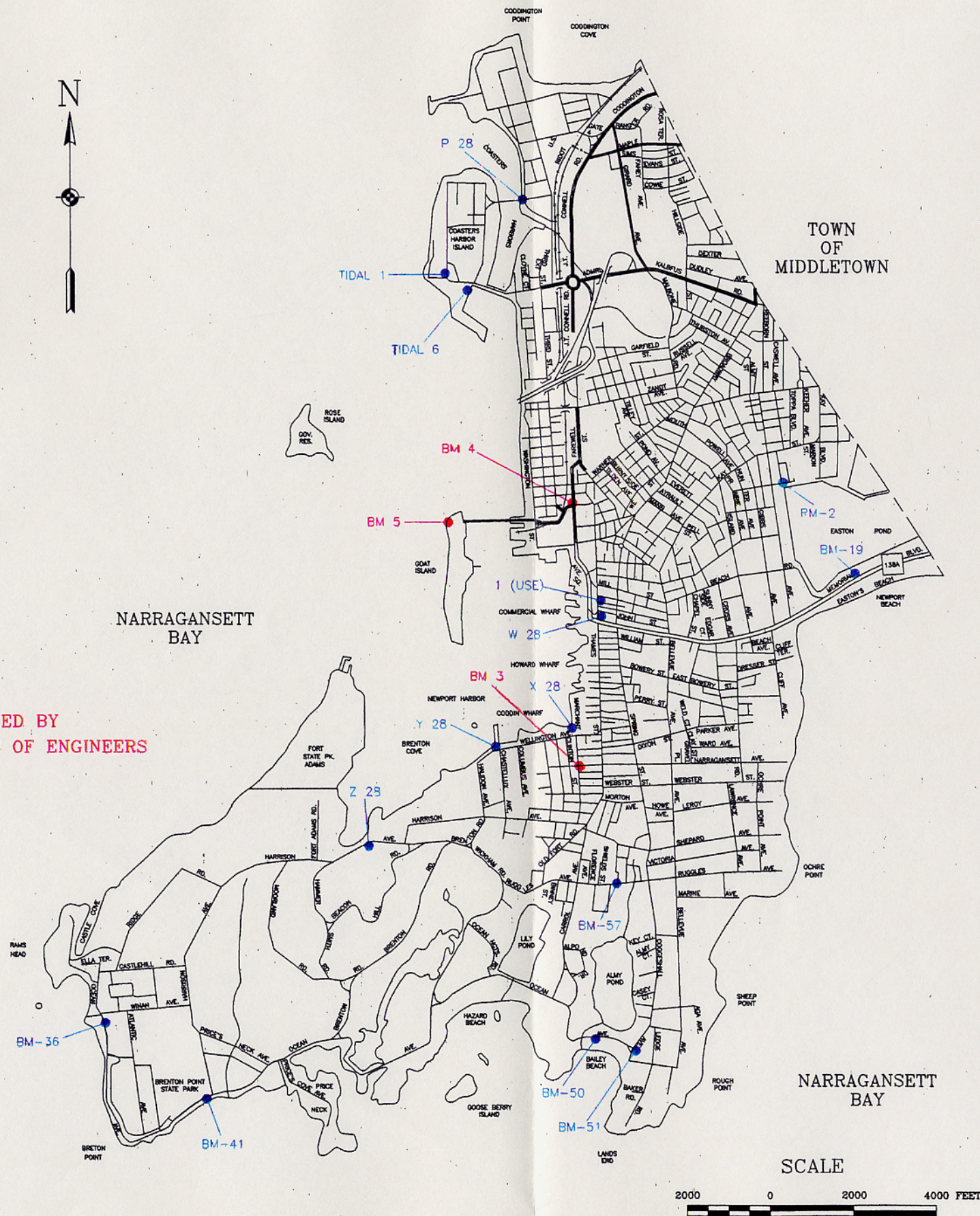
CITY OF PORTSMOUTH  
STATE OF RHODE ISLAND

FIGURE 1



# LEGEND

- EXISTING MARKS
- MARKS ESTABLISHED BY  
U.S. ARMY CORPS OF ENGINEERS

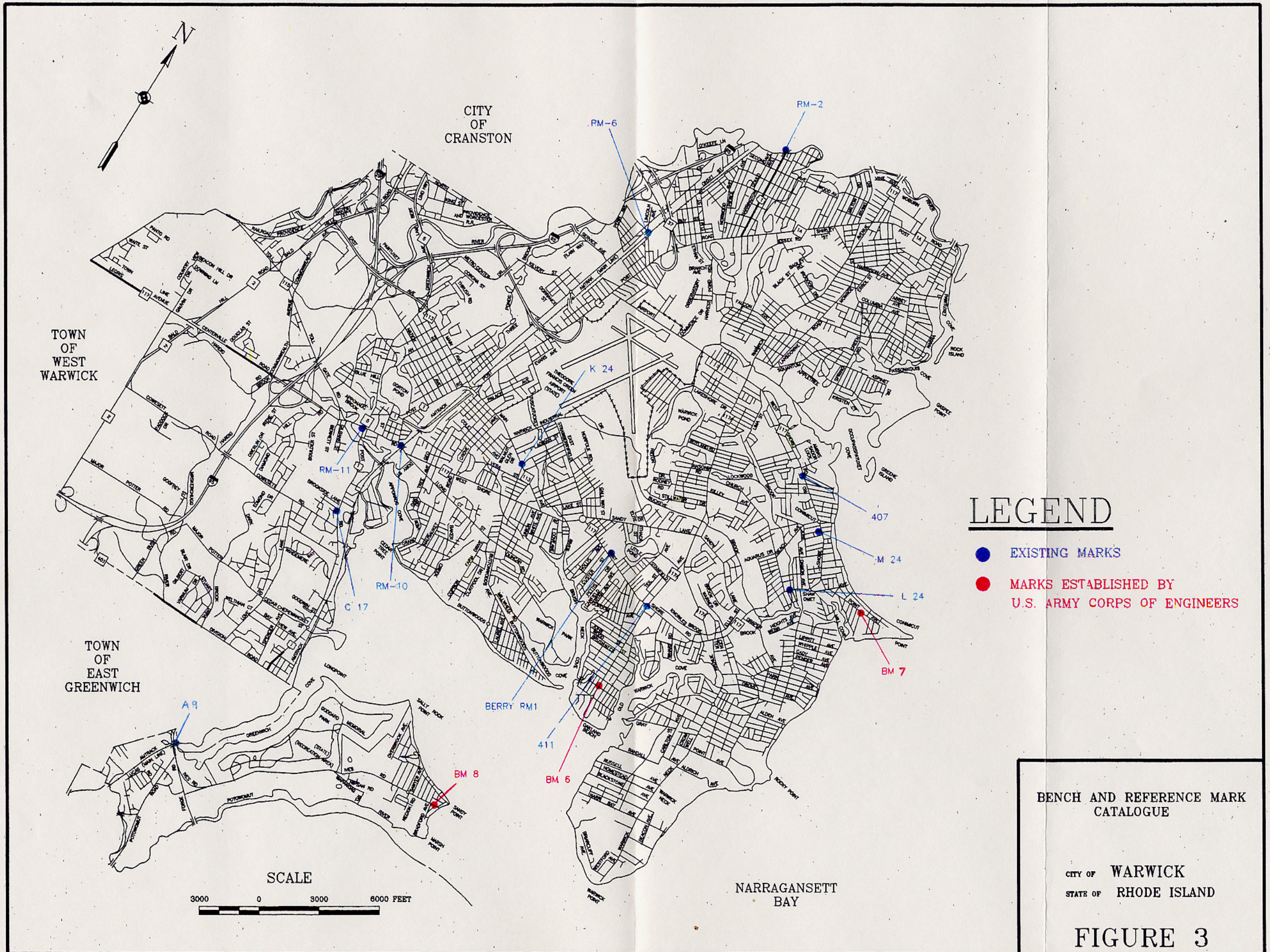


BENCH AND REFERENCE MARK  
CATALOGUE

CITY OF NEWPORT  
STATE OF RHODE ISLAND

FIGURE 2







APPENDIX

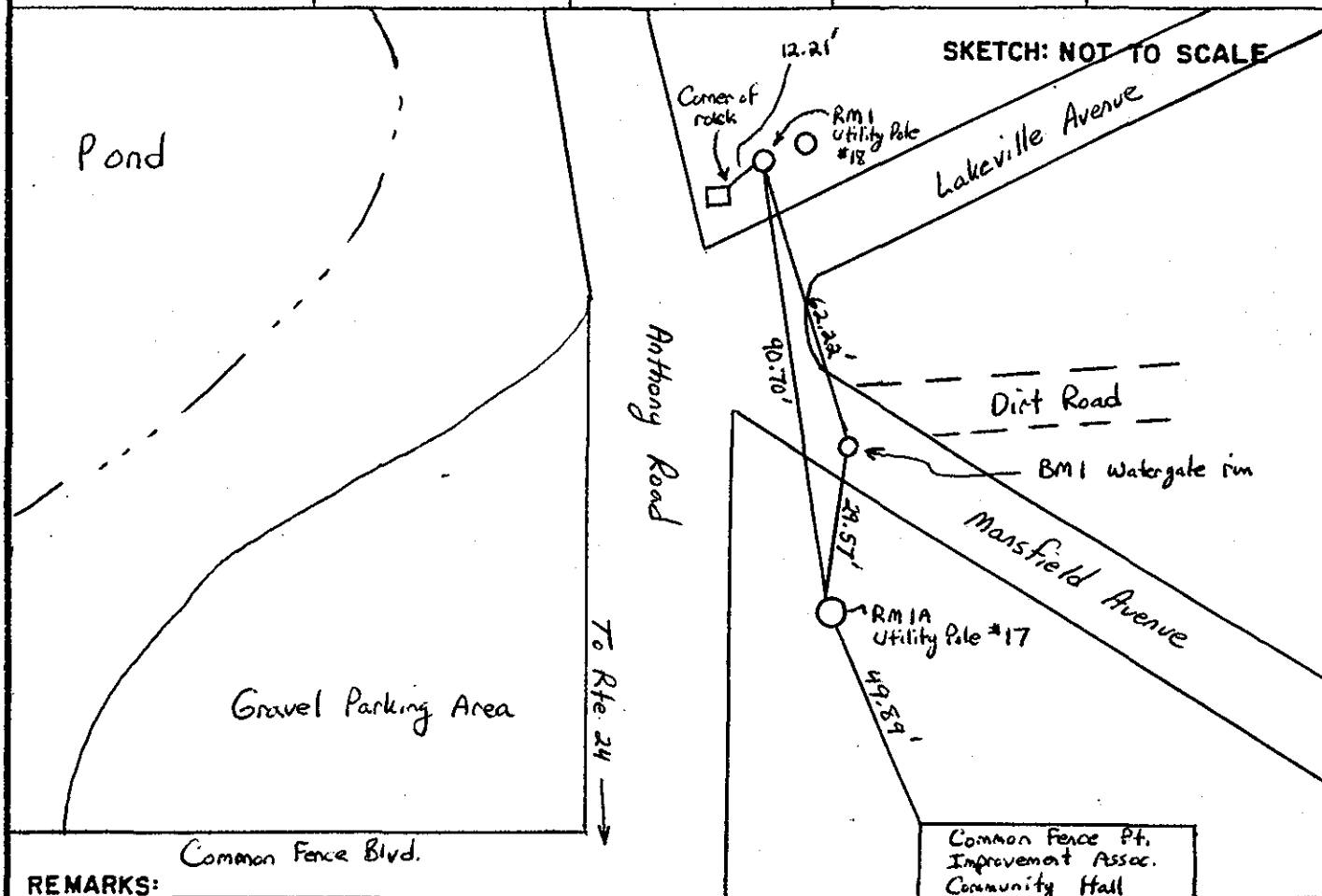
BENCH AND REFERENCE MARK INSTALLATION

FIELD NOTES

PROJECT <i>FPMS</i>	TYPE OF MARK <i>X-Cut in W.G. Rim</i>	STATION <i>BM 1</i>		
LOCALITY <i>Portsmouth, RI</i>	STAMPING ON MARK	AGENCY (CAST IN MARKS) <i>USACE</i>	ELEVATION <i>11.23</i>	(M)
LATITUDE	LONGITUDE	DATUM	DATUM <i>NGVD</i>	
(NORTHING) (FT)	(EASTING) (FT)	GRID AND ZONE	ESTABLISHED BY (AGENCY) <i>USACE</i>	
(NORTHING)(EASTING) (FT) (M)	(EASTING)(NORTHING) (FT) (M)	GRID AND ZONE	DATE <i>5/24/94</i>	ORDER

TO OBTAIN GRID AZIMUTH, ADD TO THE GEODETIC AZIMUTH  
TO OBTAIN GRID AZ. (ADD(SUB.)) TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC)(GRID) (MAGNETIC)	BACK AZIMUTH	GEOD. DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)



REMARKS:

*Common Fence Blvd.*

*BM 1 is an X-Cut in a Water Gate rim Elev. 11.23*

*RM 1 is a railroad spike set in utility pole #18, up 0.9', elev. 13.23*

*RM 1A is a railroad spike set in utility pole #17, up 1.1', elev. 11.98*



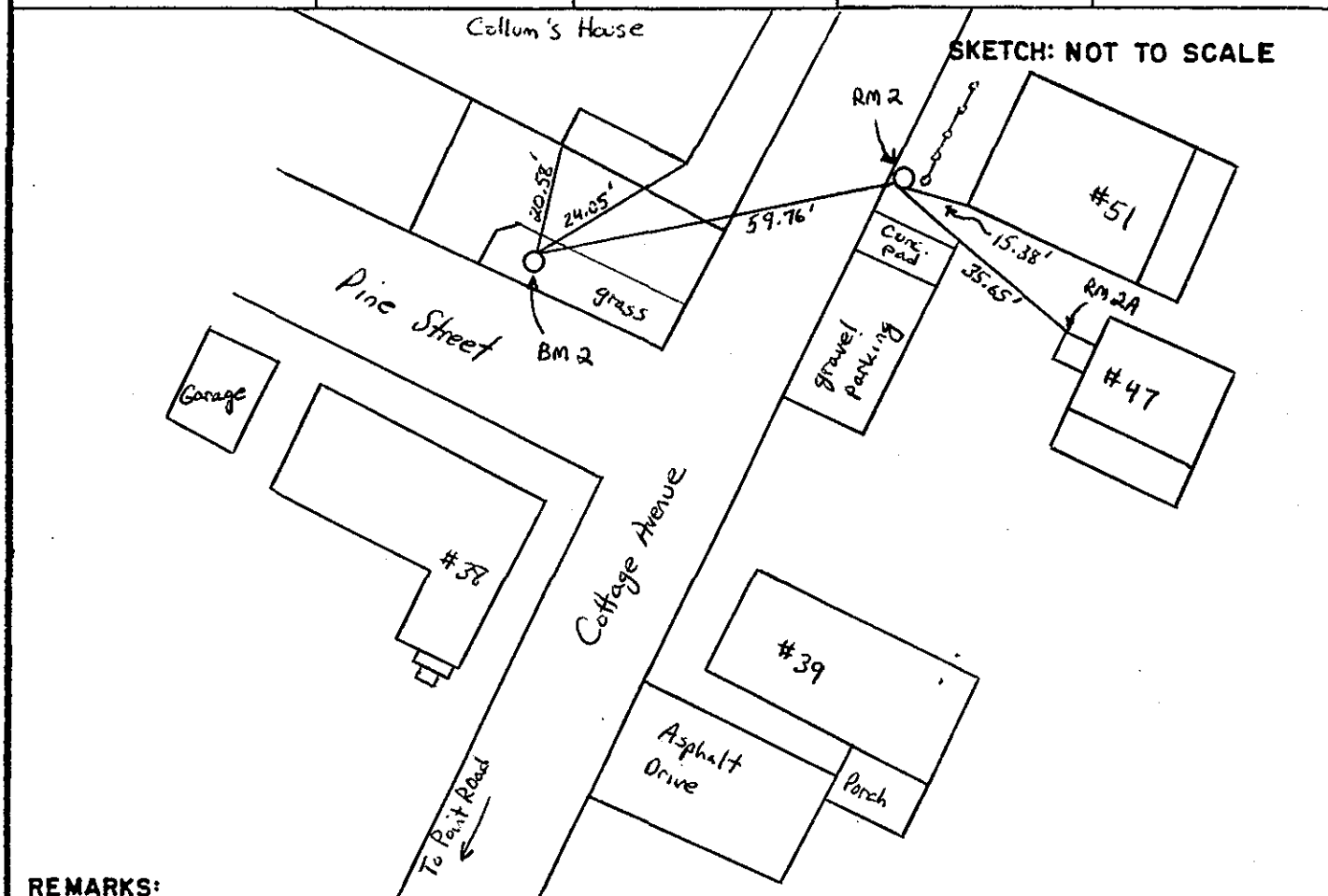
US Army Corps  
of Engineers  
New England Division

DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION  
For use of this form, see TM 5-237; the proponent  
agency is TRADOC.

REFERENCES:  
FIELD BOOK NO. \_\_\_\_\_

PROJECT <i>FPMS</i>		TYPE OF MARK <i>Railroad Spike</i>		STATION <i>Bm 2</i>	
LOCALITY <i>Portsmouth, RI</i>		STAMPING ON MARK		AGENCY (CAST IN MARKS) <i>USACE</i>	
LATITUDE		LONGITUDE		ELEVATION <i>11.78</i> <span style="float: right;">(M)</span>	
DATUM <i>NGVD</i>		DATUM		ESTABLISHED BY (AGENCY) <i>USACE</i>	
(NORTHING) (FT)	(EASTING) (FT)	(NORTHING) (FT)	(EASTING) (FT)	GRID AND ZONE	
(NORTHING) (M)	(EASTING) (M)	(NORTHING) (M)	(EASTING) (M)	GRID AND ZONE	
TO OBTAIN				TO THE GEODETTIC AZIMUTH	
TO OBTAIN				TO THE GEODETTIC AZIMUTH	

OBJECT	AZIMUTH OR DIRECTION (GEODETTIC)(GRID) (MAGNETIC)	BACK AZIMUTH	GEOD. DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)



#### REMARKS:

BM 2 is a railroad spike set 0.6' up a numberless utility pole at the intersection of Pine Street and Cottage Avenue.

RM 2 is a railroad spike set 1.2' up utility pole #4.

RM 2A is the northwest corner of a concrete stoop in front of house #47.



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of Engineers  
New England Division

DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION  
For use of this form, see TM 5-237; the proponent  
agency is TRADOC.

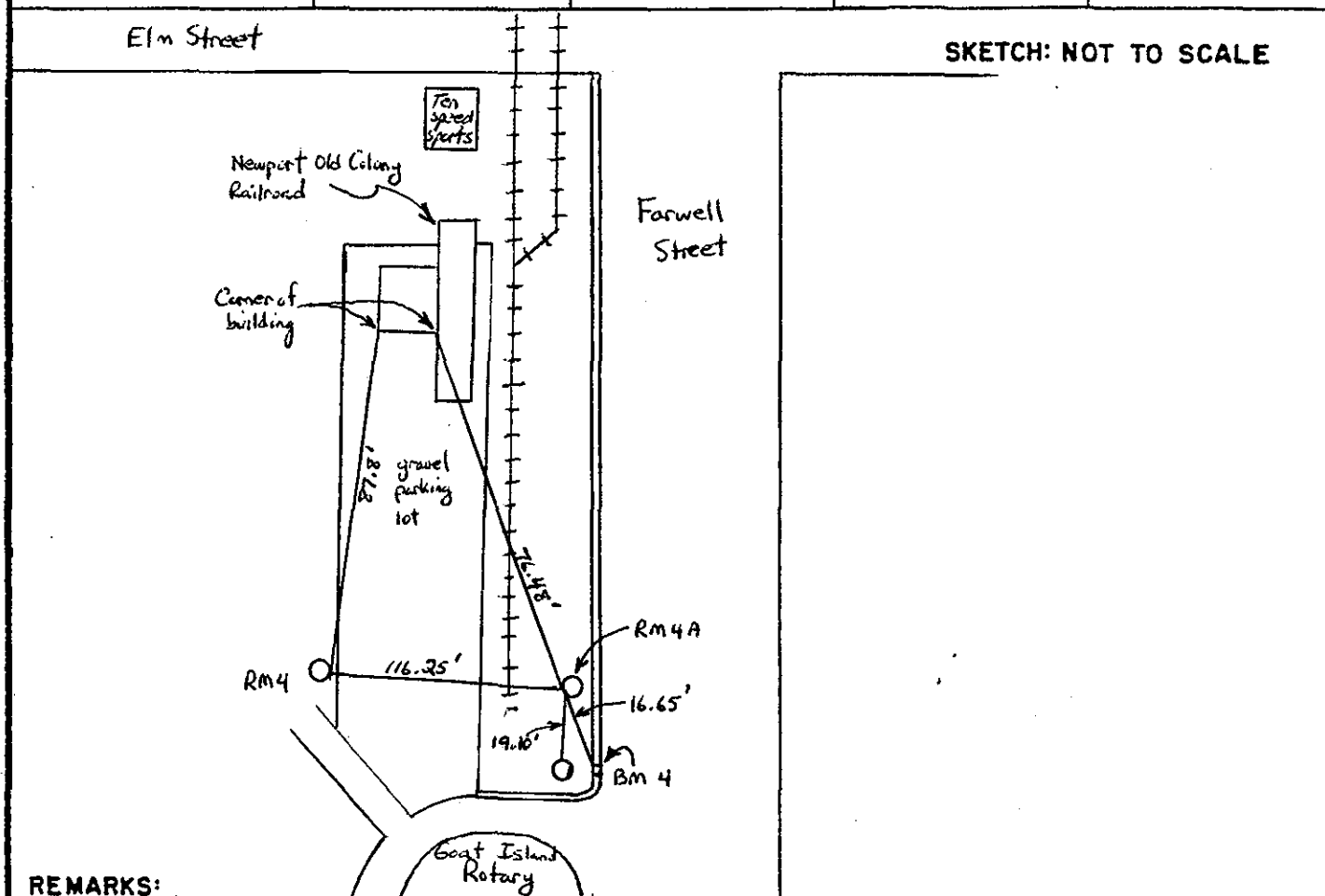
REFERENCES:  
FIELD BOOK NO. \_\_\_\_\_



PROJECT <i>FPMS</i>	TYPE OF MARK <i>Chiseled square</i>	STATION <i>BM 4</i>	
LOCALITY <i>Newport, RI</i>	STAMPING ON MARK	AGENCY (CAST IN MARKS) <i>USACE</i>	ELEVATION <i>6.54</i> <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">FT</span> (M)
LATITUDE	LONGITUDE	DATUM	DATUM <i>N6VD</i>
(NORTHING) (FT)	(EASTING) (FT)	GRID AND ZONE	ESTABLISHED BY (AGENCY) <i>USACE</i>
(NORTHING)(EASTING) (M)	(EASTING)(NORTHING) (M)	GRID AND ZONE	DATE <i>5/26/94</i> ORDER

TO OBTAIN	GRID AZIMUTH, ADD	TO THE GEODETTIC AZIMUTH
TO OBTAIN	GRID AZ. (ADD)(SUB.)	TO THE GEODETTIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETTIC)(GRID) (MAGNETIC)	BACK AZIMUTH	GEOC. DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)



#### REMARKS:

BM 4 is a chiseled square in a granite curb at the rotary to Goat Island, elev. 6.54'

RM 4 is a railroad spike set 1.3' up from the ground in utility pole #6 on the southwest edge of the gravel lot for the Newport Old Colony Railroad, elev. 7.84'

RM 4A is an x-cut in an sidewalk that holds the aluminum light post at the intersection of Farwell Street and the rotary at the bus terminal, elev. 6.43'



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DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION  
For use of this form, see TM 5-237; the proponent  
agency is TRADOC.

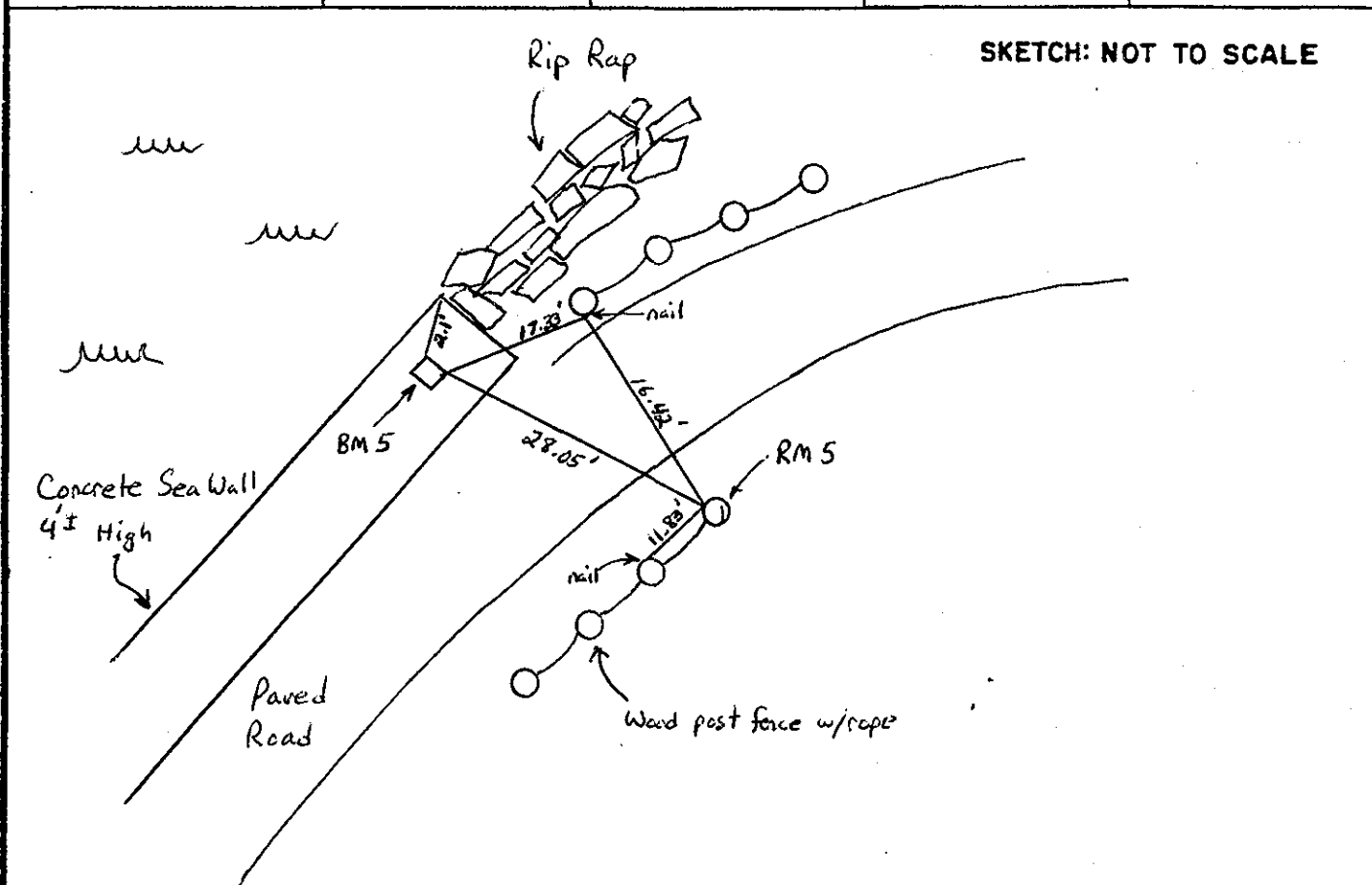
REFERENCES:  
FIELD BOOK NO. \_\_\_\_\_



PROJECT <i>FPMS</i>		TYPE OF MARK <i>Chiseled square</i>		STATION <i>BM 5</i>	
LOCALITY <i>Newport, RI</i>		STAMPING ON MARK		AGENCY (CAST IN MARKS) <i>USACE</i>	ELEVATION <i>10.49</i> (FT) (M)
LATITUDE		LONGITUDE		DATUM	DATUM <i>N6VD</i>
(NORTHING) (FT)	(EASTING) (FT)	GRID AND ZONE		ESTABLISHED BY (AGENCY) <i>USACE</i>	
(NORTHING) (FT) (M)	(EASTING) (FT) (M)	GRID AND ZONE		DATE <i>5/27/94</i>	ORDER

TO OBTAIN GRID AZIMUTH, ADD TO THE GEODETIC AZIMUTH  
TO OBTAIN GRID AZ. (ADD) (SUB.) TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC) (GRID) (MAGNETIC)	BACK AZIMUTH	GEOD. DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)



**REMARKS:**

*BM 5 is a chiseled square in a concrete sea wall behind the Newport Islander Doubletree Hotel on Goat Island, elev. 10.49'*

*RM 5 is a railroad spike set 0.8' up a wood post fence, elev. 8.64'*



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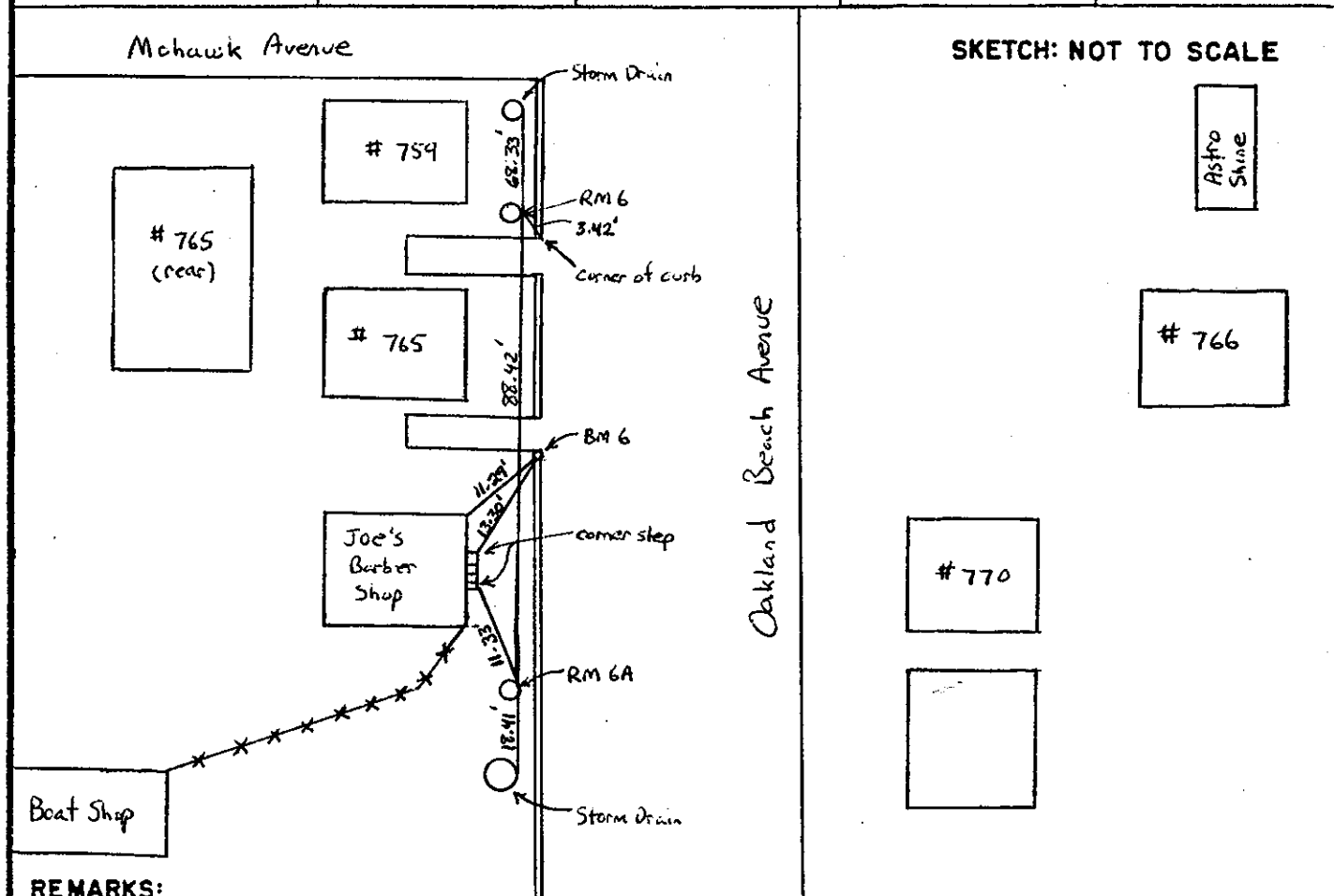
**DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION**  
For use of this form, see TM 5-237; the proponent  
agency is TRADOC.

**REFERENCES:**  
**FIELD BOOK NO.** \_\_\_\_\_

PROJECT <i>FPMS</i>		TYPE OF MARK <i>Chiseled square</i>		STATION <i>BM 6</i>	
LOCALITY <i>Warwick, RI</i>		STAMPING ON MARK		AGENCY (CAST IN MARKS) <i>USACE</i>	
LATITUDE		LONGITUDE		ELEVATION <i>10.58</i> (FT) (M)	
(NORTHING) (FT)		(EASTING) (FT)		DATUM <i>N6VD</i>	
(NORTHING)(EASTING) (FT) (M)		(EASTING)(NORTHING) (FT) (M)		ESTABLISHED BY (AGENCY) <i>USACE</i>	
				DATE <i>5/31/94</i>	
				ORDER	

TO OBTAIN	GRID AZIMUTH, ADD	TO THE GEODETIC AZIMUTH
TO OBTAIN	GRID AZ. (ADD)(SUB.)	TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC)(GRID) (MAGNETIC)	BACK AZIMUTH	GEOD. DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)



**REMARKS:**

BM 6 is a chiseled square in a granite curb in front of Joe's Barber Shop, elev. 10.58'

RM 6 is a railroad spike in utility pole #77, 1.1' above the ground, elev. 12.31'

RM 6A is a railroad spike in utility pole #78, 1.1' above the ground, elev. 11.62'



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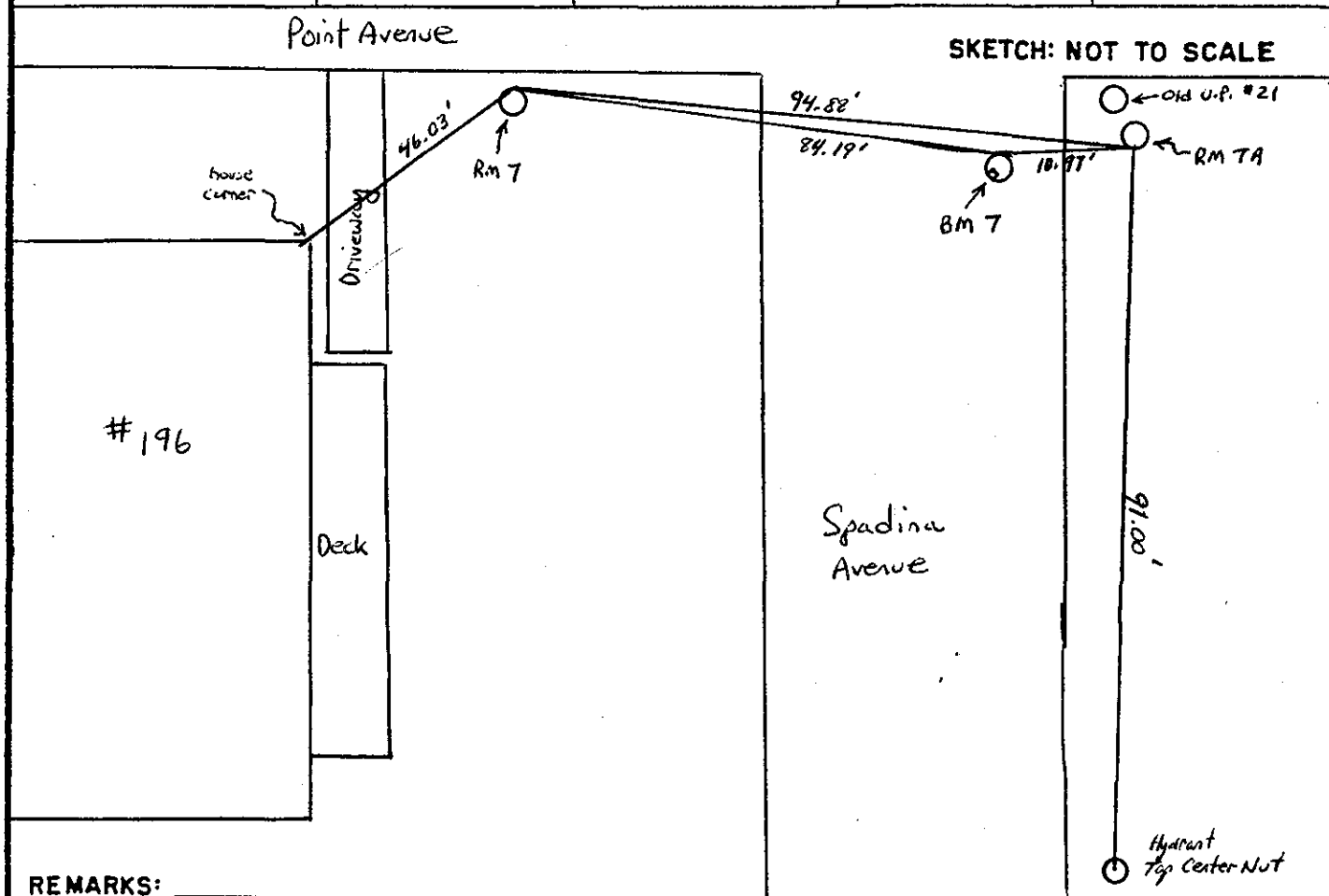
DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION  
For use of this form, see TM 5-237; the proponent  
agency is TRADOC.

REFERENCES:  
FIELD BOOK NO. \_\_\_\_\_

PROJECT <i>FPMS</i>		TYPE OF MARK <i>X-cut in watergate rim</i>		STATION <i>BM 7</i>	
LOCALITY <i>Warwick, RI</i>		STAMPING ON MARK		AGENCY (CAST IN MARKS) <i>USACE</i>	ELEVATION <i>5.73</i> (FT) (M)
LATITUDE		LONGITUDE		DATUM	DATUM <i>NGVD</i>
(NORTHING) (FT)	(EASTING) (FT)	GRID AND ZONE		ESTABLISHED BY (AGENCY) <i>USACE</i>	
(NORTHING) (EASTING) (FT) (M)	(EASTING) (NORTHING) (FT) (M)	GRID AND ZONE		DATE <i>5/31/94</i>	ORDER

TO OBTAIN	GRID AZIMUTH, ADD	TO THE GEODETIC AZIMUTH
TO OBTAIN	GRID AZ. (ADD) (SUB.)	TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC) (GRID) (MAGNETIC)	BACK AZIMUTH	GEOD. DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)



REMARKS:

BM 7 is an X-cut in a watergate rim on Spadina Avenue, elev. 5.73'

RM 7 is a railroad spike, 1.3' above the ground in pole #20, elev. 7.13'

RM 7A is a railroad spike 1.0' above the ground in pole #21, elev. 7.37'



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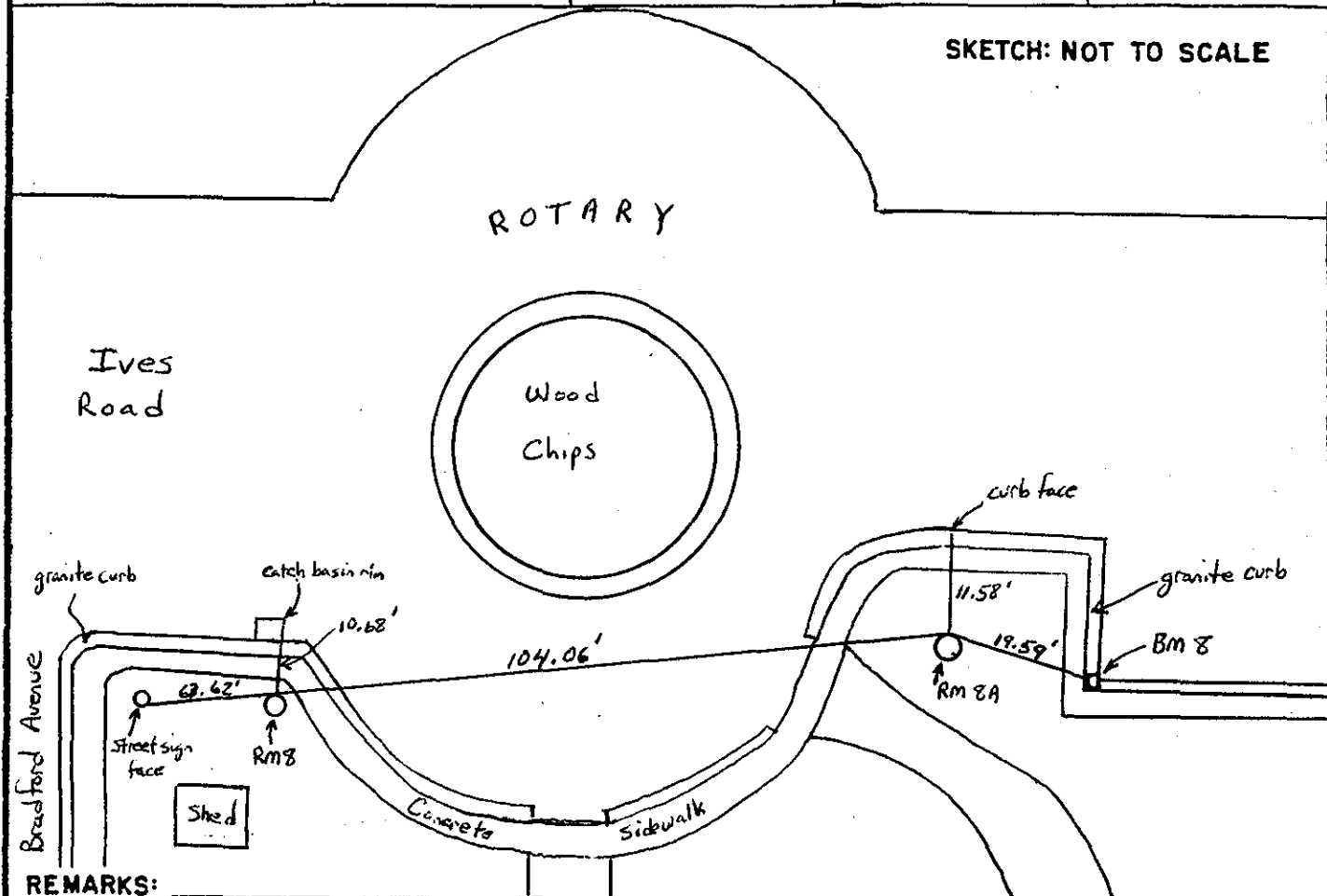
DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION  
For use of this form, see TM 5-237; the proponent  
agency is TRADOC.

REFERENCES:  
FIELD BOOK NO. \_\_\_\_\_

PROJECT <i>FPMS</i>	TYPE OF MARK <i>Chiseled square</i>	STATION <i>Bm 8</i>	
LOCALITY <i>Warwick, RI</i>	STAMPING ON MARK	AGENCY (CAST IN MARKS) <i>USACE</i>	ELEVATION <i>7.89</i> (FT) (M)
LATITUDE	LONGITUDE	DATUM <i>NAD83</i>	
(NORTHING) (FT)	(EASTING) (FT)	GRID AND ZONE	ESTABLISHED BY (AGENCY) <i>USACE</i>
(NORTHING) (EASTING) (FT) (M)	(EASTING) (NORTHING) (FT) (M)	GRID AND ZONE	DATE <i>6/3/94</i> ORDER

TO OBTAIN	GRID AZIMUTH, ADD	TO THE GEODETTIC AZIMUTH
TO OBTAIN	GRID AZ. (ADD/SUB.)	TO THE GEODETTIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETTIC) (GRID) (MAGNETIC)	BACK AZIMUTH	GEOC. DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)



REMARKS:

*Bm 8 is a chiseled square in the inside corner of a granite curb at the end of Ives Road, elev 7.89'*

*RM 8 is a railroad spike 1.2' above the ground in utility pole #59, elev. 10.58'*

*RM 8A is a railroad spike 1.2' above the ground in utility pole #60, elev. 9.76'*



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REFERENCES:  
FIELD BOOK NO. \_\_\_\_\_